

REMARKS

This application has been reviewed in light of the Office Action dated September 13, 2005. In view of the foregoing amendments and the following remarks, favorable reconsideration and withdrawal of the objections and rejections set forth in the Office Action are respectfully requested.

Claims 1, 2 and 5-11 are pending. Claims 3, 4 and 12 have been canceled, without prejudice or disclaimer of subject matter. Claims 1, 5, 9, 10 and 11 have been amended. Support for the claim changes can be found in the original disclosure, and therefore no new matter has been added. Claims 1 and 11 are in independent form.

The title was objected to as not being descriptive of the claimed subject matter. The title has been amended accordingly. Withdrawal of this objection is respectfully requested.

The specification was objected to for alleged informalities. In that regard, the specification as filed and the specification stored in the IFW of the subject application (as accessed via PAIR) were checked, and it was determined that the alleged informalities cited by the Examiner are in fact scanning errors introduced by the U. S. Patent and Trademark Office (PTO), not errors in the original specification as filed. Applicant's undersigned representative contacted the Examiner by telephone and explained this matter to the Examiner. The Examiner stated that she would see to the rectification of this matter, in particular, the re-scanning of the specification by the PTO. Per the Examiner's request, Applicant has hereby noted this matter in his response to the Office Action. Withdrawal of the objection to the specification is respectfully requested.

Claims 1-3, 7, 8, 11 and 12 were rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent Application Publication No. 2003/0095161 (*Ohde*) in view of U.S.

Patent No. 6,761,426 (*Tsuchiya et al.*) and U.S. Patent Application Publication No. 2002/0060707 (*Yu et al.*).

Claim 4 was rejected under 35 U.S.C. § 103(a) as being unpatentable over *Ohde, Tsuchiya et al.* and *Yu et al.* in view of U.S. Patent No. 5,617,122 (*Numata et al.*).

Claim 5 was rejected under 35 U.S.C. § 103(a) as being unpatentable over *Ohde, Tsuchiya et al.* and *Yu et al.* in view of U.S. Patent No. 6,719,396 (*Anzai*) and *Numata et al.* and further in view of U.S. Patent No. 5,690,437 (*Yanagisawa et al.*).

Claim 6 was rejected under 35 U.S.C. § 103(a) as being unpatentable over *Ohde* in view of *Tsuchiya et al.* and *Yu et al.* and further in view of U.S. Patent No. 6,896,345 (*Nakayama et al.*).

Claims 9 and 10 were rejected under 35 U.S.C. § 103(a) as being unpatentable over *Ohde* in view of U.S. Patent Application Publication No. 2001/0055042 (*Matsumoto et al.*) and *Yu et al.*

Since Claims 3, 4 and 12 have been cancelled, the rejections of those claims are moot. Applicant respectfully traverses the rejections of the other claims.

It is noted that independent Claim 1 has been amended to include the features of Claims 3 and 4, which have been cancelled herein.

Independent Claim 1 recites, *inter alia*, that a number of printing elements of a printhead to be used in a printing operation for one scan of a carriage (driven by a DC motor), which number is controlled by control means, satisfies a condition such that a sum of a driving current required for driving the number of printing elements and a driving current supplied to the DC motor for accelerating the carriage is equal to or lower than a capacity of a power source for

supplying electric power to a printing apparatus. Independent Claim 11 recites, *inter alia*, similar or identical features.

By virtue of these features, a printing apparatus according to Claim 1 can perform printing during acceleration or deceleration of the carriage without requiring that the capacity of the power source be increased.

Applicant submits that none of the cited art teaches or suggests at least the above-noted features of Applicant's claimed invention.

Numata et al. relates to a recording apparatus and method for controlling recording head driving timing. According to *Numata et al.*, for example, the power supplied to the print head is calculated on the basis of a number of printed dots. Then, based on the calculated power supply, the temperature rise is predicted. If the temperature rise is too great, the printing speed and/or frequency is reduced. See cols. 28-31 and Figs. 48 and 49.

The Office Action (page 6) cites *Numata et al.* as teaching "the apparatus satisfying a condition such that the sum of a driving current required for driving said number of printing elements and a driving current supplied to the DC motor for accelerating the carriage is equal to or lower than a capacity of the power source."

However, Applicant submits that nothing in *Numata et al.* would suggest that a number of printing elements of a printhead to be used in a printing operation for one scan of a carriage (driven by a DC motor), which number is controlled by control means, satisfies a condition such that a sum of a driving current required for driving the number of printing elements and a driving current supplied to the DC motor for accelerating the carriage is equal to or lower than a capacity of a power source for supplying electric power to a printing apparatus.

As explained above, *Numata et al.* teaches a technique for controlling the printing speed and/or frequency of a printhead based on a temperature change, and does not suggest controlling a number of printing elements (of a printhead to be used in a printing operation for one scan of a carriage) based on a sum of a driving current required for driving the number of printing elements and a driving current supplied to a DC motor for accelerating a carriage.

According to the invention as set forth in Claim 1, print data for printing during a period of acceleration of the carriage is counted and compared to a threshold value and, based on the comparison result, control means controls the number of printing elements to be used in a printing operation for one scan, changing the number of printing elements if necessary. The number of printing elements so used is controlled so that the sum of the driving current required for driving the given number of printing elements and the driving current supplied to the DC motor for accelerating the carriage is less than or equal to the capacity of the power source.

It is noted that temperature change occurs much more slowly than change of electric current. According to Applicant's claimed invention, printing is controlled during a period of acceleration of a reciprocally-moving carriage. Such a period (of acceleration) is very short. Consequently, quick control and response are required. Thus, the claimed invention employs electric current as a limiting variable in controlling the number of printing elements to be used in a printing operation. If the apparatus of Claim 1 employed temperature change instead of electric current, it would not be able to provide the quick response required for controlling printing during a period of acceleration of a carriage.

In addition, it is noted that *Numata et al.* controls the printing speed and/or printing frequency, if necessary, in view of the temperature rise. It is not seen that *Numata et al.* controls the number of printing elements.

In addition, nothing in *Numata et al.* is seen to suggest satisfying a condition pertaining to a sum of the recited driving currents.

In addition, nothing in *Numata et al.* is seen to suggest control of printing during a period of acceleration of a (DC) motor for driving a carriage.

For at least the reasons set forth above, it is submitted that nothing in *Numata et al.* would teach or suggest that a number of printing elements of a printhead to be used in a printing operation for one scan of a carriage (driven by a DC motor), which is controlled by control means, satisfies a condition such that a sum of a driving current required for driving the number of printing elements and a driving current supplied to the DC motor for accelerating the carriage is equal to or lower than a capacity of a power source for supplying electric power to a printing apparatus.

The Office Action (page 6) concedes that *Ohde* does not teach these features of Applicant's claimed invention, and the Office Action is understood to concede that neither *Tsuchiya et al.* nor *Yu et al.* teaches these features of Applicant's claimed invention. Applicant submits that nothing in *Ohde*, *Tsuchiya et al.* or *Yu et al.* would suggest these features of Applicant's claimed invention.

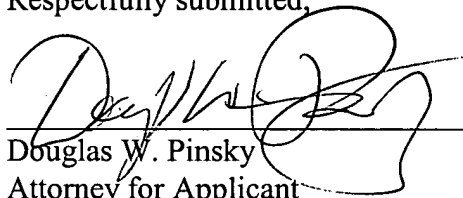
A review of the other art of record, including *Anzai*, *Yanagisawa et al.*, *Nakayama et al.* and *Matsumoto et al.*, has failed to reveal anything which, in Applicant's opinion, would remedy the deficiencies of the art discussed above, as references against the independent claims herein. These claims are therefore believed patentable over the art of record.

The other claims in this application are each dependent from independent Claim 1 and are therefore believed patentable for the same reasons. Since each dependent claim is also deemed to define an additional aspect of the invention, however, the individual reconsideration of the patentability of each on its own merits is respectfully requested.

In view of the foregoing amendments and remarks, Applicant respectfully requests favorable reconsideration and early passage to issue of the present application.

Applicant's undersigned attorney may be reached in our Washington office by telephone at (202) 530-1010. All correspondence should continue to be directed to our below listed address.

Respectfully submitted,


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